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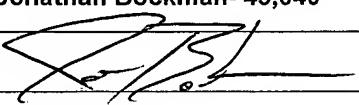
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TRANSMITTAL FORM <i>(to be used for all correspondence after initial filing)</i>		Application Number 10/169,136
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ENCLOSURES (Check all that apply)			
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<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Terminal Disclaimer	Certified Translation of Japanese Patent Application No. 89917/1994 filed on 04/27/1994	
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SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	MORRISON & FOERSTER LLP Jonathan Bockman- 45,640
Signature	
Date	June 22, 2004

I, Masahide Senoo of 16-A1-17, Takehana Jizojiminamimachi, Yamashina-ku, Kyoto-shi, Kyoto 607-8088 JAPAN, declare under penalty of perjury of the laws of the United States of America, that

1. I am familiar with the Japanese and English languages.
2. I have read the attached translation into English of Japanese Patent Application No. 89917/1994 filed on April 27, 1994 and state that the attached translation is an accurate translation of the Japanese-language original document.

I declare under penalty of perjury under the law of the United States of America that the foregoing is true and correct.

Executed at Otsu-shi, Shiga-ken this 1 day of June, 2004.

Masahide Senoo.

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(71) [Applicant] MITSUMISHI ELECTRIC CORP.

(54) [Title of the Invention] PHOTORESISTIVE RESIN
COMPOSITION

(57) [Abstract]

[Purpose] To provide a high-resolution photosensitive resin composition which has high sensitivity to radiation for exposure, in which the dissolution rate of unexposed portions of the photosensitive resin composition is low and the dissolution rate of exposed portions is high, and in which a difference in dissolution rate between the exposed portions and the unexposed portions is large when dissolved in an alkaline developing solution.

[Construction] A photosensitive resin composition containing a compound that produces an acid or a base when irradiated with light and a polymer compound (A) having a carboxyl group and a specific carboxylic ester group, those groups being side chains of the polymer compound. The photosensitive resin composition further contains a polycarboxylic ester compound, a carbonate of a polyhydric phenol, or an alkali-soluble polymer compound.

[Claims]

[Claim 1] A photosensitive resin composition containing a compound that produces an acid or a base when irradiated with light and a polymer compound having a group with a carboxyl group and at least one of a group with a carboxylic ester group represented by formula (I):

[CF 1]



(wherein R¹ represents a hydrogen atom, a methyl group, or a phenyl group; R² represents a t-butyl group or a t-amyl group; i represent 0 or 1; and j represents 0, 1, or 2, where a plurality of i are independently 0 or 1 when j is 0 or 1), a group with a carboxylic ester group represented by formula (II):

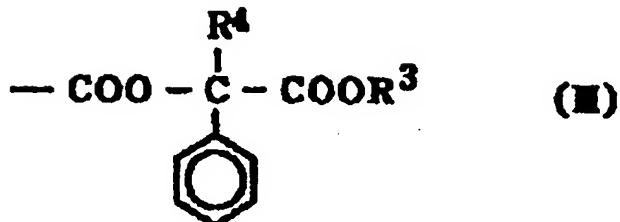
[CF 2]



(wherein R³ a t-butyl group, a t-amyl group, an isopropyl group, an allyl group, a 1-methylvinyl group, a 1,1-dimethylallyl group, a 2,5-dioxanyl group, or a tetrahydrofuryl group and k represents 0, 1, or 2), a

group with a carboxylic ester group represented by formula (III):

[CF 3]



(wherein R⁴ represents a hydrogen atom, a methyl group, or a phenyl group and R³ is the same as the above), and a group with a carboxylic ester group represented by formula (IV):

[CF 4]



(wherein R³ is the same as the above), those groups being side chains of the polymer compound.

[Claim 2] A photosensitive resin composition containing a polycarboxylic ester compound, a compound that produces an acid or a base when irradiated with light, and a polymer compound having a group with a carboxyl group and at least one of a group with a carboxylic ester group represented by formula (I):

[CF 5]



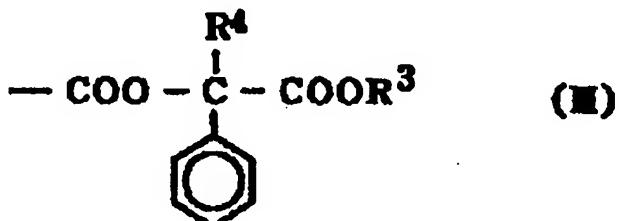
(wherein R¹ represents a hydrogen atom, a methyl group, or a phenyl group; R² represents a t-butyl group or a t-amyl group; i represent 0 or 1; and j represents 0, 1, or 2, where a plurality of i are independently 0 or 1 when j is 0 or 1), a group with a carboxylic ester group represented by formula (II):

[CF 6]



(wherein R³ a t-butyl group, a t-amyl group, an isopropyl group, an allyl group, a 1-methylvinyl group, a 1,1-dimethylallyl group, a 2,5-dioxanyl group, or a tetrahydrofuryl group and k represents 0, 1, or 2), a group with a carboxylic ester group represented by formula (III):

[CF 7]



(wherein R⁴ represents a hydrogen atom, a methyl group, or a phenyl group and R³ is the same as the above), and a group

with a carboxylic ester group represented by formula (IV):

[CF 8]



(wherein R^3 is the same as the above), those groups being side chains of the polymer compound.

[Claim 3] A photosensitive resin composition containing a carbonate of a polyhydric phenol, a compound that produces an acid or a base when irradiated with light, and a polymer compound having a group with a carboxyl group and at least one of a group with a carboxylic ester group represented by formula (I):

[CF 9]



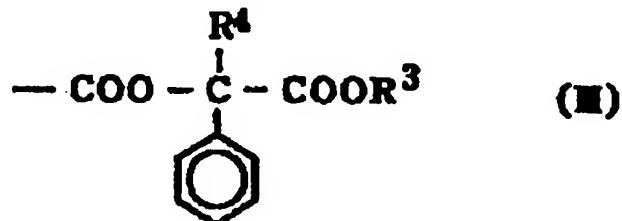
(wherein R^1 represents a hydrogen atom, a methyl group, or a phenyl group; R^2 represents a t-butyl group or a t-amyl group; i represent 0 or 1; and j represents 0, 1, or 2, where a plurality of i are independently 0 or 1 when j is 0 or 1), a group with a carboxylic ester group represented by formula (II):

[CF 10]



(wherein R³ a t-butyl group, a t-amyl group, an isopropyl group, an allyl group, a 1-methylvinyl group, a 1,1-dimethylallyl group, a 2,5-dioxanyl group, or a tetrahydrofuryl group and k represents 0, 1, or 2), a group with a carboxylic ester group represented by formula (III):

[CF 11]



(wherein R⁴ represents a hydrogen atom, a methyl group, or a phenyl group and R³ is the same as the above), and a group with a carboxylic ester group represented by formula (IV):

[CF 12]



(wherein R³ is the same as the above), those groups being side chains of the polymer compound.

[Claim 4] A photosensitive resin composition containing an alkali-soluble polymer compound, a compound that produces an acid or a base when irradiated with light, and a polymer compound having a group with a carboxyl group and at least one of a group with a carboxylic ester group represented by formula (I):

[CF 13]



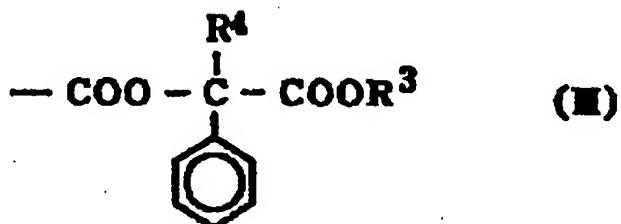
(wherein R¹ represents a hydrogen atom, a methyl group, or a phenyl group; R² represents a t-butyl group or a t-amyl group; i represent 0 or 1; and j represents 0, 1, or 2, where a plurality of i are independently 0 or 1 when j is 0 or 1), a group with a carboxylic ester group represented by formula (II):

[CF 14]



(wherein R³ a t-butyl group, a t-amyl group, an isopropyl group, an allyl group, a 1-methylvinyl group, a 1,1-dimethylallyl group, a 2,5-dioxanyl group, or a tetrahydrofuryl group and k represents 0, 1, or 2), a group with a carboxylic ester group represented by formula (III):

[CF 15]



(wherein R⁴ represents a hydrogen atom, a methyl group, or a phenyl group and R³ is the same as the above), and a group with a carboxylic ester group represented by formula (IV):

[CF 16]



(wherein R³ is the same as the above), those groups being side chains of the polymer compound.

[Claim 5] The photosensitive resin composition according to Claim 2, wherein the polycarboxylic ester compound is an acid- or base-decomposable compound having two or more groups with a polycarboxylic ester group represented by

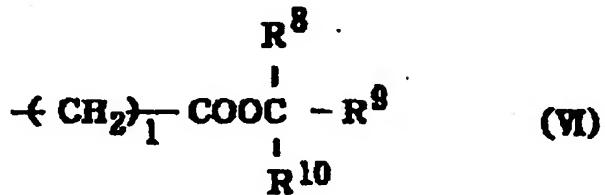
formula (V):

[CF17]



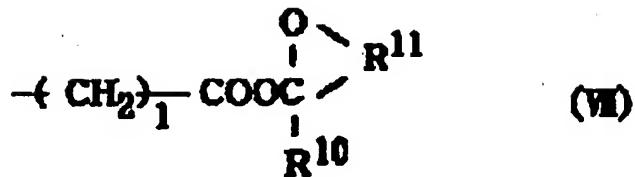
(wherein R⁵, R⁶, and R⁷ independently represent a hydrogen atom, an alkyl group having one to four carbon atoms, a halogen atom, a group with a carboxylic ester group represented by formula (VI):

[CF18]



(wherein R⁸, R⁹, and R¹⁰ independently represent a hydrogen atom, a phenyl group, an alkyl group having one to six carbon atoms, an alkenyl group having two to six carbon atoms, an alkynyl group having two to six carbon atoms, an oxyalkyl group having one to six carbon atoms, or a halogen atom and l represents an integer of 0 to 5), or a group with a carboxylic ester group represented by formula (VII):

[CF19]



(wherein R^{10} is the same as the above and R^{11} represents an alkylene group having three to six carbon atoms, a bivalent hydrocarbon group having a double bond, or a group represented by formula (VIII):

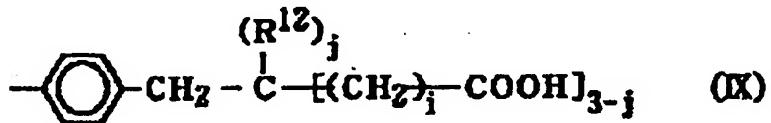


(in which m and n independently represent 1 or 2) and 1 is the same as the above), at least one of R^5 , R^6 , and R^7 being the group with the carboxylic ester group represented by formula (VI) or (VII)).

[Claim 6] The photosensitive resin composition according to Claim 4, wherein the alkali-soluble polymer compound is a polymer compound having a group with a carboxyl group, the group being a side chain of the polymer compound.

[Claim 7] The photosensitive resin composition according to Claim 1, 2, 3, or 4, wherein the group with the carboxyl group is at least one of a group represented by formula (IX):

[CF20]



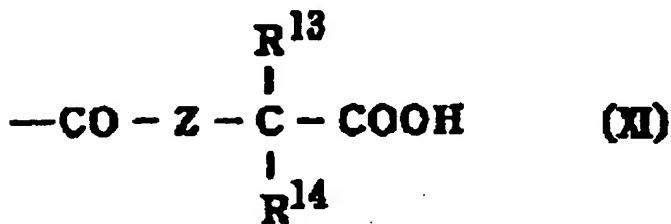
(wherein R¹² represents a hydrogen group or a methyl group, i represents 0 or 1, and j represents 0, 1, or 2), a group represented by formula (X):

[CF21]



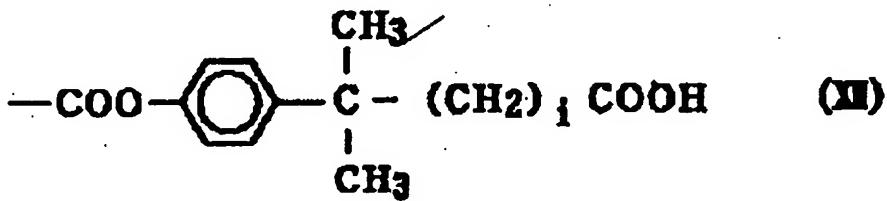
(wherein k represents 0 or 1), a group represented by formula (XI):

[CF22]



(wherein R¹³ and R¹⁴ independently represent a hydrogen group, a methyl group, a phenyl group, a benzyl group, or CH₂COOH, and Z represents O, N(C₆H₅), or NH), and a group represented by formula (XII):

[CF23]



(wherein i is the same as the above), the group with the carboxyl group being contained in the polymer compound having at least one of the groups each having the carboxylic ester group represented by formula (I), (II), (III), or (IV), those groups being side chains of the polymer compound.